

1990

4-H 349 The Green Food Factory : Student Workbook

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Nebraska Cooperative Extension 4-H 349



The Green Food Factory

Student Workbook



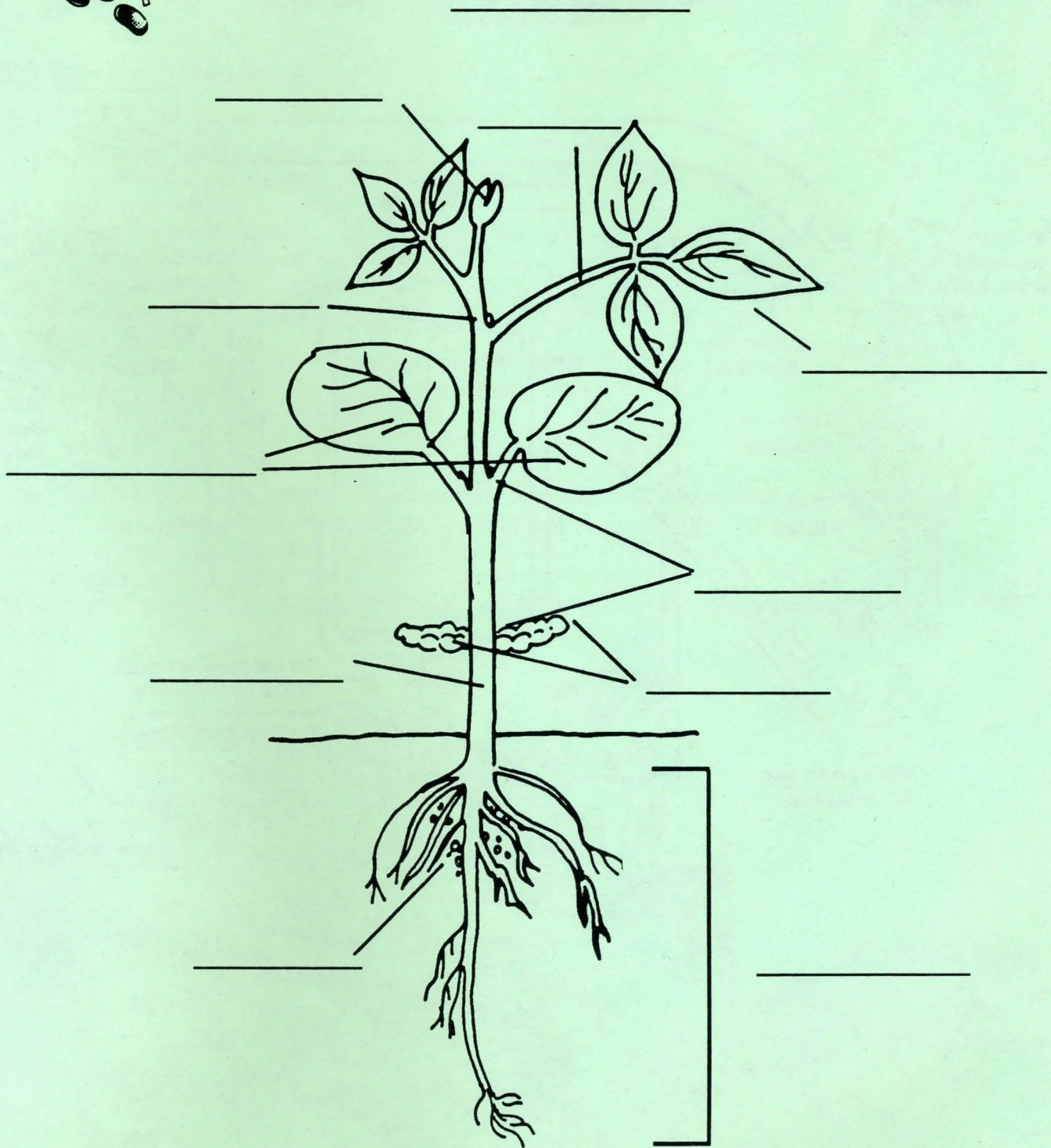
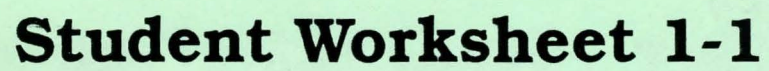
A 4-H School Enrichment Project



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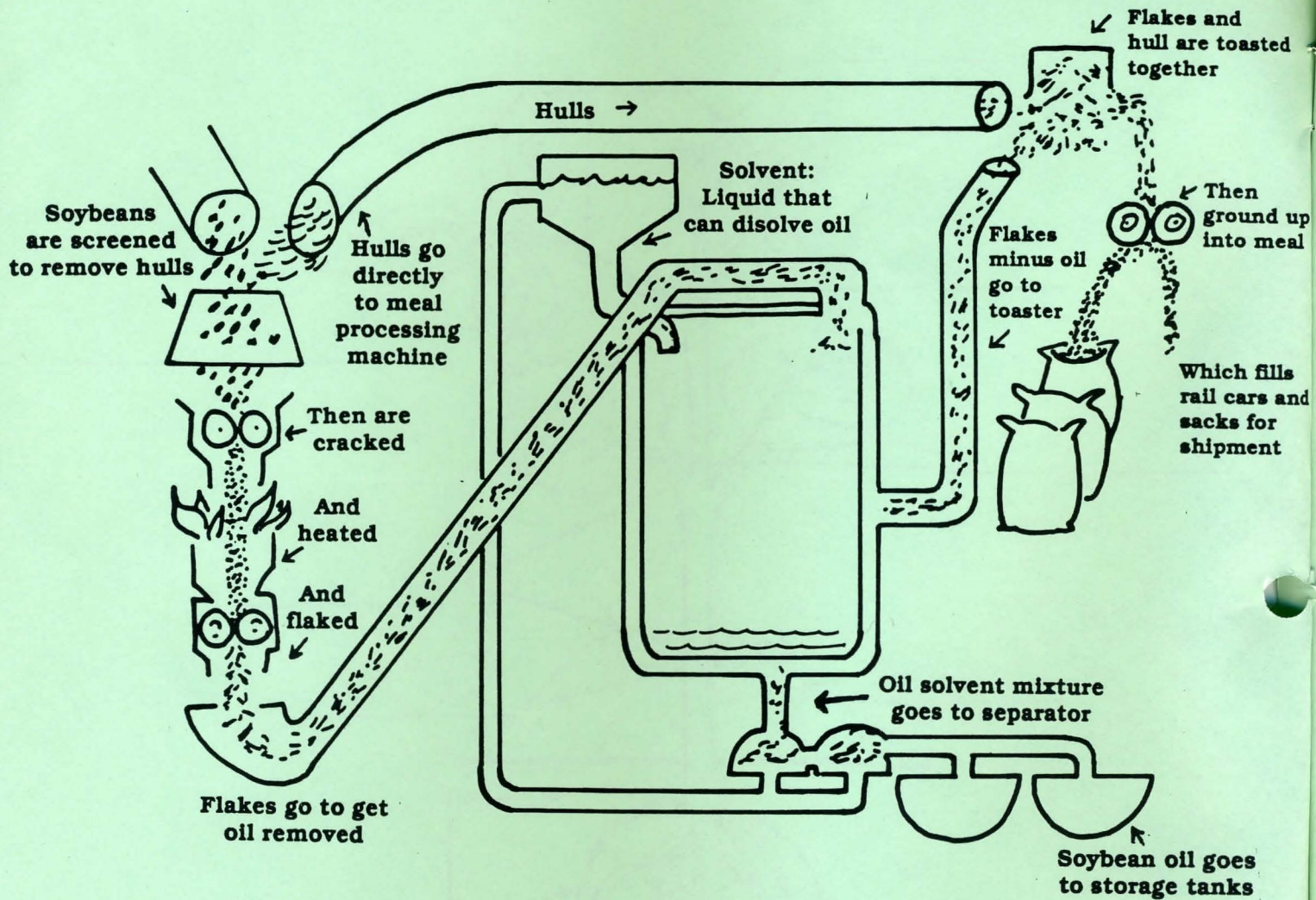
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Student Worksheet 2-1

How Soybean Oil and Meal are Prepared





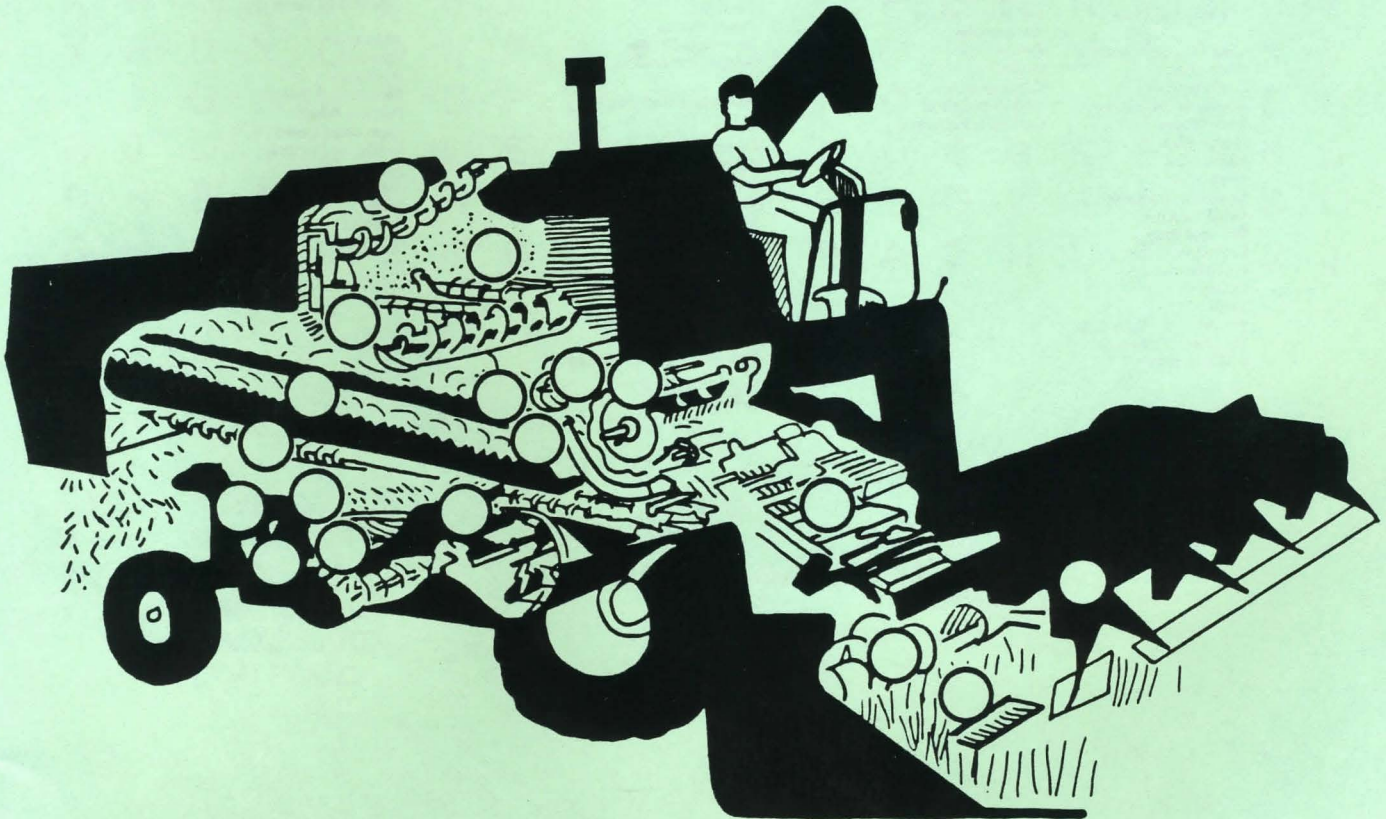
Student Worksheet 2-2

Soybean Combine

Basic Combine Operation

The Reel

- (1) holds crop against Cutterbar
- (2) Cutterbar cuts crop. Reel pushes crop into path of Auger
- (3) Auger moves crop to Feeder Conveyor
- (4) Feeder Conveyor delivers crop to Threshing Cylinder
- (5) Threshing Cylinder and Concave
- (6) thresh crop. Rotary Deflector
- (7) strips straw from cylinder and deflects grain through Finger Grate
- (8) Straw Walkers
- (9) shake grain from straw. Grain and chaff fall onto Grain Augers.
- (10) Grain Augers feed grain to Cleaning Shoe.
- (11) Grain falls through Chaffer
- (12) and Sieve.
- (13) Clearing Fan
- (14) blows away chaff as grain falls through cleaning shoe. Clean Grain Elevator
- (15) moves clean grain to Grain Tank Loading Auger.
- (16) Loading Auger distributes grain evenly in Grain Tank.
- (17) Tailing fall off end of Sieve
- (18) and are carried by Tailings Elevator (not shown) to Threshing Cylinder for rethreshing.





Student Worksheet 2-4

Soybean Products Word Search

Find the soybean by-products (forwards, backwards, and diagonal).

V S L L U H W U G S O F L O V E D A Y T I
R U O L F Y O S K E S O D J D P W K M J L
W K O N B F K S O A P S P F J I L L T U K
R P W F K T E K D A U O P H R Q N S S I L
S H A F M E A T E X T E N D E R S L O B N
W G L I G V D Y P H D R Y X V M J A Y U F
T F L S N R H D K L F S B J D I P S B I C
H S B H R T T L Z D Y O P S K C L E E N C
S Q O F W D I B E E F W D U K F E G A J K
I D A O M M C A E L F W O D K D E E N E L
N W R O M W K T D W G E G O K E C M F K L
R A D D A M A J K R D F F G D C S D L H U
A H U D J L S X G H R F O F K A N A A U P
V H D Y O O K F S A L A D O I L C A K K L
X J G C U P O F C H I L I O O T K T E E U
H J O U G J L E G L I K E D E B S E S S S
C H E S T E R E H E K E L E O W S P S S O
C H E B D E G D O O F Y B A B H U T E D J

There are 15.

SOYFLOUR
SOYBEAN FLAKES
BEEF
BABY FOOD
WALLBOARD
DOG FOOD

SOAPS
PAINT
SALAD OIL
CHOCOLATE
FISH FOOD

MEAT EXTENDERS
MILK
HULLS
VARNISH
PLYWOOD



Student Worksheet 2-5

Dry Bean Word Search

Words are forwards, backwards and diagonal.

A	S	D	F	G	H	K	L	P	O	I	U
Y	T	P	R	F	I	B	E	R	W	Q	Z
X	C	V	I	N	O	R	T	H	E	R	N
B	N	M	A	N	S	D	F	G	H	J	K
L	P	P	O	I	T	U	Y	R	E	W	Q
Z	I	X	N	C	V	O	B	N	M	P	O
I	N	O	A	U	Y	T	B	R	E	W	Q
A	K	S	V	D	F	G	H	E	J	K	L
P	O	I	Y	U	T	R	E	W	A	Q	Z
X	C	V	B	W	I	N	D	R	O	W	N
M	Q	W	E	R	T	Y	U	I	O	P	A
S	D	F	A	G	H	J	K	L	P	Q	W
Z	E	L	T	R	U	T	K	C	A	L	B
X	C	V	B	Y	E	N	D	I	K	N	M
Q	E	R	T	Y	U	I	O	P	M	D	S

There are eight.

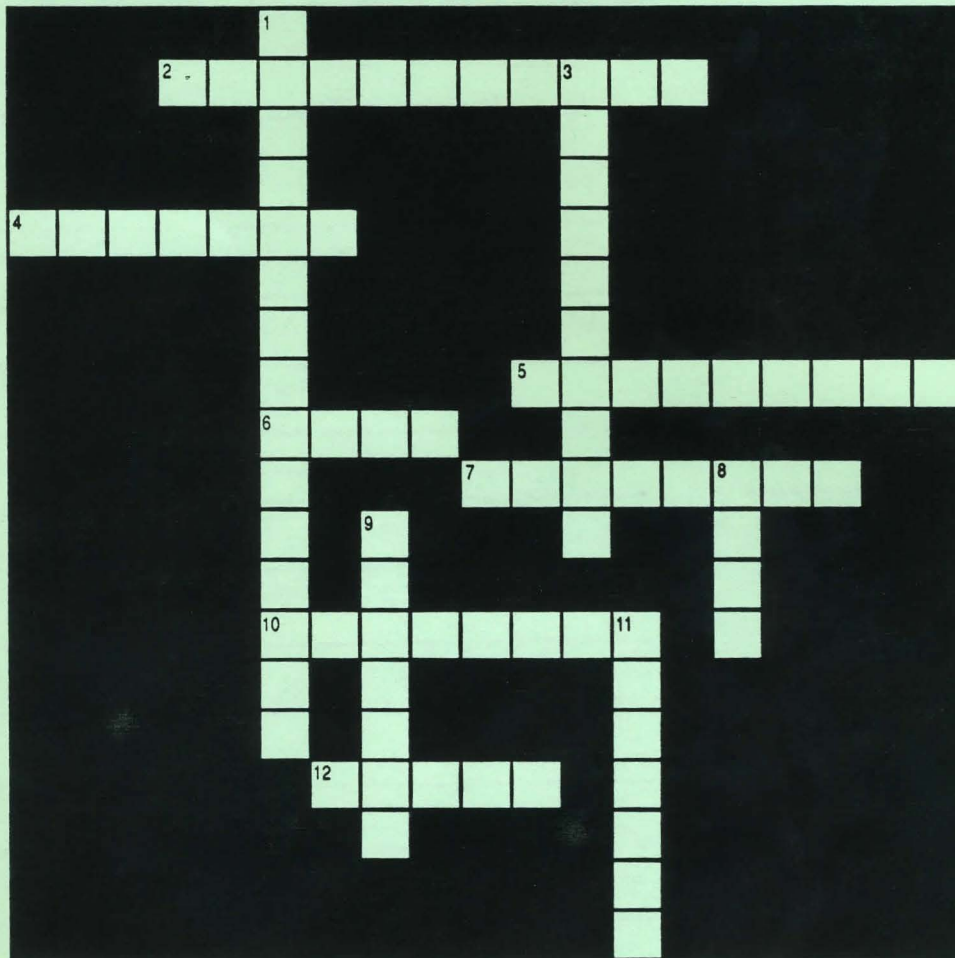
FIBER
NAVY BEAN
PINTO BEAN
KIDNEY

WINDROW
NORTHERN
BLACK TURTLE
PINK



Student Worksheet 3-1

Know Your Nutrients



Across:

2. Found in animals, this wax-like substance is made in the liver.
4. A mineral that helps our bodies build strong bones and teeth.
5. A fatty acid carrying the maximum number of hydrogen atoms.
6. A soybean curd that looks like cottage cheese and is a source of protein.
7. B vitamin that helps develop a healthy nervous system.
10. Oils such as coconut, palm and palm kernel that contain a high amount of saturated fat.
12. The part of the plant that humans cannot digest.

Down:

1. A fatty acid in which two or more points could carry a hydrogen atom.
3. B vitamin that helps develop a healthy nervous system.
8. A mineral that helps carry oxygen to the brain.
9. A nutrient that builds and repairs cells and tissues in our bodies.
11. Plants that have nodules on their roots that capture nitrogen and make protein.



Student Worksheet 3-3

Looking at Food Labels

Product Name: _____ Net Weight:

Manufacturer:

Address:

1. Nutrition Information - Per Serving

Serving Size: _____ Weight/or Number

Servings Per Container:

Calories: _____ Protein: _____ Carbohydrates:

Fat: _____ Sodium: _____ Potassium:

2. Ingredients: (List first seven)

Product Name: _____ Net Weight:

Manufacturer:

Address:

1. Nutrition Information - Per Serving

Serving Size: _____ Weight/or Number

Servings Per Container:

Calories: _____ Protein: _____ Carbohydrates:

Fat: _____ Sodium: _____ Potassium:

2. Ingredients: (List first seven)



Student Worksheet 4-1

Supermarket Math Student Worksheet

Visit the grocery store. Find the price per pound for each of the following food items. Divide the price per pound by the **Food Factor**. The answer will give you the price for equal amounts of protein from each food item. Answer the questions at the bottom of the page.

Food	Price per pound	Food Factor	Price for Equal Protein Amount
Dry beans (uncooked)	_____	+6	_____
Dry beans (canned)	_____	+2	_____
Beef roast (boneless)	_____	+5	_____
Ground beef	_____	+6	_____
Chicken fryer	_____	+3	_____
Pork chops	_____	+5	_____
Fish fillets	_____	+6	_____
Eggs (use price per dozen)	_____	+6	_____

A. Arrange the food from most costly to least costly in terms of price per equal amount of protein.

Most Costly

Least Costly

B. How do dry beans rank among the foods you surveyed? _____

C. Write a statement about how you can use dry beans in your diet. Consider cost, quality of protein, nutritional value and preparation.



Student Worksheet 5-1

Practical Math Problems

1. _____ bags
A farmer wants to plant 150,000 seeds per acre in his soy bean field. There are 1,500 seeds in 1 pound of soybeans. How many 50 pound bags will it take to plant the 8 acre field?
2. _____ times
A farmer has a planter that will plant 8 rows, each 30 inches wide. If the farmer's field is $\frac{1}{4}$ mile or 1,320 feet wide, how many times will he have to drive across his field to finish planting it?
3. _____ pounds
A farmer wants to check his 8 row planter to see if it is planting enough seed in his field. He wants to plant 10 seeds per foot in the field. There are 1,600 seeds per pound in the soybeans he uses. If the farmer goes 100 feet, how many pounds of seed should he use?
4. _____ acres
A farmer has 50 bags of soybean seed that weighs 50 pounds each. The farmer wants to plant 100 pounds of soybean seed per acre. How many acres can the farmer plant with the supply of seed that he has?
5. _____ rows
A farmer has a combine that is 20 feet wide. The farmer used an 8 row planter with 30 inch wide rows. How many rows will the farmer be able to harvest at one time when he goes across the field.?
6. Yes or No
_____ rows
A farmer has a combine that is 20 feet wide. His neighbor used a planter that plants 6 rows that are 40 inches wide. Will the farmer be able to help his neighbor combine his beans? If so, how many rows will he be able to harvest?
7. _____ bushels
A bushel of soybeans weighs 60 pounds. A farmer harvests 3,600 pounds of soybeans from 2 acres. How many bushels per acre is the farmer harvesting?
8. _____ bushels
A farmer has a truck that weighed 16,000 pounds when it was empty . He went to the field and filled the truck with soybeans he harvested. When he weighed the truck after it was filled, it weighed 34,000 pounds. If soybeans weigh 60 pounds per bushel, how many bushels does this truck contain?
9. _____ bushels
A farmer harvested 144,000 pounds of soybeans from an 80 acre field. Soybeans weigh 60 pounds per bushel. How many bushels per acre did the farmer's field yield?

10. Yes or No

_____ bushels

A farmer has a bin that will hold 3,000 bushels of soybeans. A bushel of soybeans weighs 60 pounds. If a farmer harvests 192,000 pounds of soybeans, will the crop fit into his bin? How many bushels can it still hold or how many extra bushels does he have?

11. _____ hours

A farmer is harvesting his soybeans his soybeans with a combine that burns 5 gallons of fuel per hour. The tank on the combine holds 90 gallons of fuel. How many hours can the farmer harvest before he runs out of fuel?

12. _____ times

A farmer has a combine that holds 300 bushels of soybeans. The farmer also has a semi-trailer truck that will haul 72,000 pounds of grain to the elevator. If a bushel of soybeans weighs 60 pounds, how many times an the farmer unload the combine in the truck?

13. _____ bushels

A farmer has a combine that will harvest 10 acres every hour. The field is yielding 30 bushels per acre. How many bushels will the farmer harvest at the end of a 10 hour day



Student Worksheet 6-1

Factors of Production

List the factors of production used by a farmer to grow soybeans and dry beans. Also list the factors needed to get the product from the field to the table.

NATURAL RESOURCES _____

LABOR _____

CAPITOL GOODS _____

ENTREPRENEURSHIP _____



Student Worksheet 6-2

Demand Schedule and Curve

List how many bottles of pop you would buy each day for each price listed. Assume you would buy at least one bottle a day.

Price	Number I Would Buy
\$.80	
.70	
.60	
.50	
.40	
.30	
.20	
.10	

Now suppose it is summer and very hot outside. How many bottles of pop would you buy?

Price	Number I Would Buy
\$.80	
.70	
.60	
.50	
.40	
.30	
.20	
.10	

Plot the demand schedule on graph paper to show the demand curves for bottles of pop.

	\$.80						
P	.70						
r	.60						
i	.50						
c	.40						
e	.30						
	.20						
	.10						
		1	2	3	4	5	6 7
		Bottles of Pop					

Make up a demand schedule for a different product—jeans, Nintendo games, etc.



Student Worksheet 6-3

Supply Schedule and Curve

It costs you \$.15 to produce a bottle of pop. How many bottles would you produce at each price? Plot this supply curve.

	\$.80
	.70
Price per	.60
Bottle	.50
	.40
	.30
	.20
	.10

1	2	3	4	5	6	7
Number of Bottles Produced						



Student Worksheet 6-4

Charting prices from CBOT

Record and graph daily CBOT soybean prices. Choose one month and record daily price for a week.

For example:

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Price per bushel	7.03	7.04	7.08	7.06	7.08

Day (dates)	Monday	Tuesday	Wednesday	Thursday	Friday
Price per bushel					



Student Worksheet 6-5

Careers in the Production and Marketing of Soybeans

A list of businesses and professions involved in the complex economic system that produces soybeans and dry beans and its many end products more efficiently and economically than anywhere in the world.

Seed Production

Research

Plant Breeder, Experimental Farm Manager,
Experimental Milling & Banking by University
and USDA scientists

Seed Production

Grower, State Crop Improvement Association,
Seed Cleaning, Firms, Seed Treatment and Chemicals

Seed Marketing

Producer, Seed Companies, Seed Salesperson,
Transportation, Storage

Soybean/Dry Bean Production

Grower
Landlord, Land Owner
Farm Machinery Supplier - Manufacturer, Dealer
Irrigation Equipment Supplier
Supplier of Fuel, Tires, Batteries, etc.
Supplier of Fertilizer - Manufacturer, Dealer
Custom Spreading Equipment
Ag Chemical Supplier for Seed Control
Custom Combine Operator
Transportation, Truck
Insurance Crop - Local Agent, Company, U.S. Government
Trade Association Soybean Growers Association
U.S. Soybean Growers Association
The Soybean Quality Council

Soybean/Dry Bean Storage

Grower - On Farm
Suppliers of storage bins and handling equipment such as augers, elevators
Suppliers of aeration and drying equipment
Sanitation technicians, management, research
Suppliers of chemicals for insect control and equipment for application
such as sprayers, probes, etc.
Suppliers of temperature monitoring equipment
Commercial storage - country elevator, terminal elevator, port elevators,
subterminal elevators

Soybean/Dry Bean Marketing

Grain Buyer - Country Elevator, Subterminal, Terminal and Flour Mill
Grain Broker, Grain Merchandisers, Grain Inspection - State Grain Inspection
Department, FGIS, USDA, Private Agencies and Personnel
Grain Elevator
Operating Personnel - Manager, Superintendent, Laborers, Office Personnel,
Grain Grader